

6.1

## Solving Equations by Using Inverse Operations

## LESSON 3

Jan 21-8:53 AM

Connect

## SOLVING EQUATIONS:

Isolate the variable first using the **zero effect**.If variable is **Greater than 1**, Divide by the number in front of the variable to make the variable one whole.

$$\frac{2x}{2} = x$$

If variable is **less than 1**, multiply by the denominator to make the variable one whole.

$$\frac{x}{3} \times 3 = x$$

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## SOLVING EQUATIONS:

Equations are like balance scales (BOTH SIDES EQUAL)

WHATEVER MATHEMATICAL OPERATION YOU DO TO THE LEFT SIDE, YOU MUST DO THE SAME MATHEMATICAL OPERATION TO THE RIGHT SIDE.

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## SOLVING EQUATIONS:

EXAMPLE:

$$\frac{y}{3} + 5 = 8$$

$$\frac{y}{3} + 5 - 5 = 8 - 5$$

$$\frac{y}{3} = 3$$

$$3 \left[ \frac{y}{3} \right] = 3(3)$$

$$y = 9$$

Things to Remember

- ✓ Did you isolate the variable?
- Did you have to divide by the number in front of the variable?
- ✓ Did you need to get rid of the fraction?
- Did you need to expand?
- Did you have to collect like terms first?

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## SOLVING EQUATIONS:

EXAMPLE:

$$\begin{aligned} 3(k-2) &= 6 \\ 3k-6 &= 6 \\ 3k-6+6 &= 6+6 \\ 3k &= 12 \\ \frac{3k}{3} &= \frac{12}{3} \\ k &= 4 \end{aligned}$$

Things to Remember

- ☒ Did you isolate the variable?
- ☒ Did you have to divide by the number in front of the variable?
- ☐ Did you need to get rid of the fraction?
- ☒ Did you need to expand?
- ☐ Did you have to collect like terms first?

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## SOLVING EQUATIONS:

EXAMPLE:

$$\begin{aligned} \frac{x-2}{3} &= \frac{x+3}{4} \\ 12\left[\frac{x-2}{3}\right] &= 12\left[\frac{x+3}{4}\right] \\ 4(x-2) &= 3(x+3) \\ 4x-8 &= 3x+9 \\ 4x-3x-8 &= 3x-3x+9 \\ x-8 &= 9 \\ x-8+8 &= 9+8 \\ x &= 17 \end{aligned}$$

Things to Remember

- ☒ Did you isolate the variable?
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- ☒ Did you need to get rid of the fraction?
- ☒ Did you need to expand?
- ☐ Did you have to collect like terms first?

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## SOLVING EQUATIONS:

EXAMPLE:

$$\begin{aligned} \frac{x}{8} + \frac{1}{2} &= \frac{3}{2} \\ 8\left[\frac{x}{8}\right] + 8\left[\frac{1}{2}\right] &= 8\left[\frac{3}{2}\right] \\ x+4 &= 12 \\ x+4-4 &= 12-4 \\ x &= 8 \end{aligned}$$

Things to Remember

- ☒ Did you isolate the variable?
- ☐ Did you have to divide by the number in front of the variable?
- ☒ Did you need to get rid of the fraction?
- ☐ Did you need to expand?
- ☐ Did you have to collect like terms first?

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# Practice

## YOU TRY!

$\begin{aligned} \frac{x}{4} + 6 &= -12 \\ \frac{x}{4} + 6 - 6 &= -12 - 6 \\ \frac{x}{4} &= -18 \\ 4\left[\frac{x}{4}\right] &= -18(4) \\ x &= -72 \end{aligned}$	$\begin{aligned} 3(x-2) &= 6 \\ 3x-6 &= 6 \\ 3x-6+6 &= 6+6 \\ 3x &= 12 \\ \frac{3x}{3} &= \frac{12}{3} \\ x &= 4 \end{aligned}$	$\begin{aligned} \frac{x+2}{5} &= \frac{x+3}{2} \\ 10\left[\frac{x+2}{5}\right] &= 10\left[\frac{x+3}{2}\right] \\ 2(x+2) &= 5(x+3) \\ 2x+4 &= 5x+15 \\ 2x-2x+4 &= 5x-2x+15 \\ 4 &= 3x+15 \\ 4-15 &= 3x+15-15 \\ -11 &= 3x \\ \frac{-11}{3} &= \frac{3x}{3} \\ x &= -\frac{11}{3} \end{aligned}$
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Practice

### CLASSWORK

Question 11 - 15 on the worksheet

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